

- Cathedral Registry Office, Chichester (proposed by F. J. W. Crowe);
 R. W. Giblin, Director of the Royal Survey Department of Siam, Bangkok, Siam (proposed by Sir David Gill);
 J. W. Short, Astronomical Photographer, The Observatory, Sydney, New South Wales, Australia (proposed by F. K. McClean); and
 William H. Tapp, Lieut., Queen's Bays, Hounslow, Middlesex (proposed by E. A. Reeves).

Sixty-eight presents were announced as having been received since the last meeting, including, amongst others:—

F. Ristenpart, *Fehlerverzeichniss zu den Sternatalogen des 18 und 19 Jahrhunderts*. Presented by the Editor of the *Astronomische Nachrichten*.—H. Gylden (the late), *Traité analytique des orbites absolues des huit planètes principales*. Tome 2. Presented by the R. Acad. of Sciences, Stockholm.—J. Bainbridge, *Canicularia* [with Gravius and Ulug Beig]. 8vo. Oxford, 1648. Presented by W. H. Wesley.

On the nature of the Hydrogen Flocculi on the Sun. By G. E. Hale, Assoc. R.A.S., For. Mem. R.S.

[From the Royal Society's Provisional Report of their Meeting,
 June 17, 1909.]

Photographs of the *H α* line in the spectrum of the solar disc, made on Mount Wilson with high dispersion, were shown on the screen. The line appears as follows:—(1) a broad dark line, differing greatly in intensity and width in different regions of the Sun. Except in eruptive or rapidly changing phenomena, the differences in width are not very marked; (2) within the boundaries of the dark line a narrow single or multiple bright line is photographed in many parts of the Sun. Sometimes the appearance resembles that of the calcium lines *K₂* and *K₃*—*i.e.* the bright line lying on its dark background is divided into two components by a central dark line. In other regions the bright line is divided into a larger number of components, varying in width and separation.

The images of dark hydrogen flocculi, on spectroheliograph plates taken with camera slit about equal in width to *H α* , appear to be due, in the main, to local increase in the intensity of the dark line. In some parts of the Sun, particularly those where the line is distorted, variations in the width of the line may also play an important part.

The increased intensity of the dark line is probably the result of increased absorption. Slides were shown to illustrate the fact

that prominences at the Sun's brink are frequently recorded as dark flocculi when photographed in projection against the disc.

The possible effects of anomalous dispersion were discussed, and photographs were exhibited of the same region of the Sun, taken simultaneously with light from the red and violet edges of *H α* . The similarity of these photographs apparently indicates that anomalous dispersion is not the prime factor in producing the hydrogen flocculi. Certain minor differences suggest, however, that it may perhaps play a secondary part in modifying their form.

On Ancient Eclipses. By P. H. Cowell, M.A., F.R.S.

I have calculated the twenty-one eclipses of which a list was given by Mr. Fotheringham, *M.N.*, lxix. p. 29. In the light of Ginzel's calculations and of the constant doubt as to the exact place of observation, it was to be expected that no formulæ would render all these eclipses central at the places named by Mr. Fotheringham. The best authenticated eclipse seems to be that of +484 at Athens, which is rendered total by both Professor Newcomb's formulæ and my own, exact centrality corresponding approximately to the mean of our formulæ. In addition to the eclipse of +484, my formulæ satisfy the eclipses of -187 (Rome), +218 (Rome), +393 (Constantinople) well; Professor Newcomb's satisfy -393 (Chæronæa), +447 (Chiaves) well. My formulæ satisfy +186 (Rome) rather better than Professor Newcomb's, while for +334 (Sicily) his formulæ satisfy rather better than mine. There is nothing noteworthy in the records except that in -393 totality is expressly denied.

Mr. Fotheringham's last paper is most interesting, chiefly because he bases conclusions on the eclipse of -1062 and the eclipse of Hipparchus only, with little or no stress laid on confirmation arising from other records. That is to say, that in the opinion of a historian competent to judge, these two records are intrinsically of a very high value. My belief that the eclipse of -1062 at Babylon is trustworthy was mainly based on its agreement with several others, though I fully recognised that intrinsically it was among the best that I used. I naturally welcome Mr. Fotheringham's attitude towards this eclipse. As to the eclipse of Hipparchus, we may, it seems, fairly accept Mr. Fotheringham's verdict that at some time between the foundation of Alexandria and the death of Hipparchus an eclipse occurred, which requires to be identified with the record. As far as approximate totality at the Hellespont is concerned, Professor Newcomb's formulæ can be reconciled with the identifications -189 March 14, -182 October 19, -173 October 10, and -128 November 20. My formulæ can be reconciled with the identifications -309 August 15, -173 October 10, -103 July 19. All eclipses total at the Hellespont must be large partial eclipses at Alexandria, but undoubtedly, of those above